

# Rhodora

JOURNAL OF THE  
NEW ENGLAND BOTANICAL CLUB.

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BENJAMIN LINCOLN ROBINSON, Editor-in-chief.

FRANK SHIPLEY COLLINS

MERRITT LYNDON FERNALD

HOLLIS WEBSTER

} Associate Editors.

WILLIAM PENN RICH

EDWARD LOTHROP RAND

} Publication Committee.

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## THE NEW ENGLAND BOTANICAL CLUB

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### NOTES OF A WILD GARDEN.

G. U. HAY.

POSSIBLY some of the readers of RHODORA may be interested in the experiment of a wild garden which I planned and started some twelve years since, on a two-acre lot about eleven miles from the city of St. John, New Brunswick. The plan was somewhat ambitious, being intended to show within this small area all the flowering plants and ferns, and their allies of New Brunswick, with possibly a few others, trees and shrubs from other latitudes, for the purpose of comparison. The latter are kept quite distinct from the "Natives" in the cultivated or open portions of the garden.

The abundant shade of a fine grove, with a northern exposure and a depression running through it, in which is retained ample moisture during the dry season, furnishes a suitable habitat for ferns and other plants requiring shade and moisture. The rocks and miniature gorges of the grove have welcomed the ferns especially; and, almost without effort, beyond the transplanting, these interesting plants of the provinces, with but few exceptions, have flourished in the natural home provided for them. And here it may be said, the whole aim in the management of the garden has been to let nature have a free hand with the exception of necessary clearing and pruning, and to obey her more obvious dictates.

In one corner of the garden is a meadow very suitable for the plants from the alluvial river bottoms of the upper St. John and its tributaries, and the Restigouche and other rivers of the Province. This meadow represents considerable toil as well as pleasure, but the results have not always been what my too sanguine hopes led me to expect. The meadow was teeming with vegetation when I began, and the original inhabitants have made a stern fight against extirpation in



order to afford a habitat for the northern hordes brought in to disturb their hitherto peaceful life. But as I look upon those transplanted ones, that have grown and flourished, they recall — and I live over again — canoe voyages on northern rivers, tent-life amid woodland scenery, the sight of large game in these solitudes, deadly struggles with small game, such as mosquitoes and black flies, as I dug up the coveted treasures and, with wearied arms and back, toiled through thickets and bogs to bring them safely to their destination.

But the *pièce de résistance* in this meadow has been the brook. My plan was to turn it aside in quiet bays and little placid lakes, on whose bosom should repose water lilies, and where I should have at a glance all our aquatic plants. But the turbulent little stream, dashing down from the adjacent hill sides, has carried away — root and branch — the plants placed too confidently within the limits of its bed. It refuses to become a partner to my scheme and emits a gurgle of delight at every fresh failure of mine to win it over, or at least to secure its passive non-resistance.

Beyond, to the southward, there rises a hill whose fertility has been drained to enrich the grove and meadow below it. The soil is dry and poor, covered with a growth of pines, firs, birches, shrubs and heath plants. Here the Heather (*Calluna vulgaris*), transplanted from Point Pleasant Park, Halifax, has flourished for several years — an evidence of the sterility of the soil. Here stands an aged white pine, the sole survivor of a fire which swept over the place scarcely two decades ago. The scarred and blackened trunk and upper branches, extended imploringly, tell of its struggle for life. Crossing a slight depression another knoll is reached on which stands a small summer cottage where I shall be glad to welcome any reader of RHODORA and show him, in part at least, a wild garden of New Brunswick plants, with, alas, the graves of some of those that have perished because of the too near approach to the Bay of Fundy's chill fogs and winds.

In the garden there are over five hundred species of flowering plants and ferns, many of which were *in situ*, while others have been planted during the past twelve years. The ferns, trees and shrubs, and those flowering plants most easily transferable are more largely represented. The ferns embrace a nearly complete list of this class of New Brunswick plants. The trees and shrubs are also well represented. Of the eighty species found in the province more than two-

thirds are growing and in good condition, and in a short time I hope to have this portion of our flora complete. Little or no attempt has been made to arrange the plants according to any system of classification, the chief aim being to provide natural habitats and surroundings, as far as possible. For a record of observations, made up to the end of the season of 1898, on the plants of the garden I may refer any one interested to Bulletin XVII of the Natural History Society of New Brunswick.

ST. JOHN, NEW BRUNSWICK.

## THE FRUITING OF *RICCIA NATANS*.

A. B. SEYMOUR.

*Riccia natans* is abundant in a small pond near Mount Auburn, Cambridge. Early in the season the surface of the pond is well covered with it, as observed by Prof. L. M. Underwood and myself in 1891. Presumably, it abounds every spring, but I have given it no attention since 1891, till now. Early this spring it was floating in great abundance along the shore of the pond. In June the pond, which is shallow, becomes filled with a growth of water-grasses and other plants, and the water in the pond is considerably lower than at first, even in a season that is not very dry.

The tendency of the winds is to wash the floating *Riccia* ashore and as the water recedes the plants are left on the mud. Weeds soon spring up and hide them.

I have heard conflicting reports regarding the fruiting of this plant. One says it fruits floating, another that it fruits on the mud. The fact is, that fruit is found after the spores have had *time to mature*. I have examined the plants this spring, from week to week, from the earliest indication of fruiting to the completion of mature spores. The first mature spores were found about June 1, on both floating plants and those fixed to the mud. Now, at the end of June, no floating plants are seen. Plants on the mud have abundant spores at full maturity. The fruit is figured in Gray's Manual.

CAMBRIDGE, MASS.



## THE NEW ENGLAND SPECIES OF DICTYOSIPHON.

F. S. COLLINS.

THE genus *Dictyosiphon* was founded by Greville in 1830, on the *Conferva foeniculacea* of Hudson, which, for a long time, was the only species. There are now about ten species recognized, all but one inhabiting the North Atlantic and Arctic oceans, extending also a short distance into the North Pacific. The one exception, which, when better known, may have to be transferred to another genus, occurs in South Pacific and Antarctic waters.

The genus is characterized by a terete, more or less abundantly branched frond, growing by an apical cell, by whose rapid division and the repeated division of the segments cut off, the frond is formed; consisting of an inner layer of rather large, loose, colorless cells, elongated in the direction of the length of the frond, and an external layer of small, roundish or squarish colored cells. Unilocular sporangia, spherical or flask-shaped, are formed in the cortical layer, immersed or slightly projecting; plurilocular sporangia are unknown.

There are two subgenera, characterized thus:—

## EU-DICTYOSIPHON.

Species of large size, slender, filiform, little or not at all gelatinous; branches and ramuli not attenuate at the base; cortical cells small; sporangia usually scattered, single.

## COILONEMA.

Of smaller size; branches of first and second orders long, sub-simple, hollow, inflated, tapering to both ends, especially to the base; cells of the cortical layer large, rounded; sporangia in groups.

Not one of the characters given above, however, is always to be depended on; indeed, in a good proportion of individual plants, some characters of one subgenus will be found combined with characters of the other.

Specific limitations are vague; very distinct types can be selected, but all possible intermediate forms are found, and the determination of individual specimens is often a matter of considerable difficulty, and sometimes impossible. The following key will only approximately indicate the New England forms:

Frond with stout percurrent axis and simple branches of nearly uniform length,  
*D. Macounii* Farlow.

Frond quite slender, simple or with very few branches,  
*D. Ekmani* Areschoug.

Frond repeatedly branched,

All branches nearly the same size as the main stem.

Branches not contracted at the base, *D. hippuroides* (Lyng.) Kuetz.

Branches contracted at the base,

*D. hippuroides* var. *fragilis* (Harv.) Kjellm.

Branches of successive orders smaller and smaller, the ultimate very slender,

All except the oldest parts beset with uniformly short ramuli,

*D. hispidus* Kjellman.

No definite short ramuli; branches not contracted at base,

*D. foeniculaceus* (Huds.) Grev.

No definite short ramuli; branches contracted at base,

*D. foeniculaceus* var. *Americanus* Collins

It will be noticed that no account has been made of color, although nearly all descriptions speak of *D. hippuroides* as being dark brown, *D. foeniculaceus* and *D. hispidus* light brown. The writer's experience is that in the living plant age and exposure have more influence than have specific differences; while in the dried specimens the manner of preparation may make more difference than anything else.

Altogether the most common form in Europe is *D. foeniculaceus*, the type of the genus; but in New England it seems to be not very abundant, at least in its typical form. The main stem bears numerous alternate branches, each bearing branches of the second order, followed by third and other orders, each order being more slender than the preceding, the ultimate very fine. Occasionally the main stem and some of the larger branches are hollow, otherwise all are solid.

In Southern New England the typical form is seldom found, but its place is taken by what appears to be an undescribed variety, for which I propose the name var. *Americanus*. The contracted bases of the branches, the often longitudinally seriate cortical cells, and the sporangia frequently in groups, show a tendency to the subgenus *Coilonema*, while the size of the plant, the branches of several orders growing successively more slender, agree with typical *D. foeniculaceus*. In habit it resembles *Striaria attenuata*, Grev., more than it does typical *D. foeniculaceus*. The northernmost point at which it has been found is at Weymouth, Mass. (F. S. C.), in the warm water colony established there. It is the common Dictyosiphon at Newport, R. I. (Mrs. W. C. Simmons), and at Bridgeport, Conn. (Isaac Holden). South of New England it extends at least as far as Atlantic City, N. J. (S. R. Morse). It occurs chiefly on *Phyllitis fascia* (Fl. Dan.) Kuetz., in less frequency on *Scytosiphon lomentarius* (Lyng.) Ag., and occasionally on other algae; it is found chiefly in spring.



The plant which in northern New England has passed largely for *D. foeniculaceus* appears to be rather *D. hispidus* Kjellm. In general habit it is not unlike the older species; the branching is abundant and pretty regularly alternate, and the younger parts are uniformly beset, often quite densely, with subulate or filiform ramuli, two or three cm. long. These appear to be of a distinct class from the normal branches, and of limited growth, remaining of the same dimensions, while normal branches continue to grow and branch indefinitely. The writer has collected this species at various points from Nahant, Mass., to Mount Desert, Maine, and it probably continues along the Canadian shore, as it occurs in Greenland, Spitzbergen and Norway. It seems to prefer rocky pools on rather exposed coasts, and grows by preference on *Chordaria flagelliformis* (Fl. Dan.) Ag. It is in its best condition in July and August.

*D. hippuroides* (Lyng.) Kuetz, like the last species, has often passed under the name of *D. foeniculaceus*, and it must be confessed that it is not easy to distinguish the two. *D. hippuroides* is a coarser plant, less branched, the branches of various orders more nearly of the same size and less tapering. Our plant, as compared with the European forms, is of looser structure, and has a larger central cavity. It is our largest species, and in favorable situations may reach a meter in length. What appears to be a reduced form, not over a decimeter in height, is found at Newport, R. I. (Mrs. Simmons). There is no other record of its occurrence south of Nahant, but from that point north it is common, usually growing on *Chordaria flagelliformis*, occasionally on other algae.

*D. hippuroides* var. *fragilis* (Harv.) Kjellman, has the branches of the first order of nearly the same diameter throughout, except at the base, where they are distinctly constricted; branches of higher order than the first are few; the general habit is that of the subgenus *Coilonema*, and extreme forms also resemble *D. Macounii* Farlow. It is common at Marblehead Neck, Mass., in company with the type, both on *Chordaria flagelliformis*.

In the typical form of *D. Macounii* Farlow there is a stout main axis like a *Scytosiphon*, and similarly hollow; from this issue numerous branches of nearly uniform length, and seldom divided or branched; they are either straight or incurved, and taper to both ends. This form occurs in the Gulf of St. Lawrence; only a reduced form, approximating *D. hippuroides*, occurring in New England. This was



found by the writer at Mount Desert, Maine, in tide pools, in company with *D. hippuroides*, in July.

*D. Ekmani* Areschoug is a smaller plant than any of the species yet named, the fronds seldom exceeding five cm. in length. They are normally simple, but sometimes have a few short branches. They are very slender, in the American form of nearly uniform diameter, while in the European form they are considerably larger in the middle than at either end. The sporangia are full as large in this species as in the others, somewhat larger in the American than in the European form. It is a plant of the upper tide pools, growing on *Scytosiphon lomentarius*, which it covers quite densely. It is common about Nahant in spring and early summer, extending northeast to the boundary, and is found also at Yarmouth, N. S. (Herb. Farlow.)

Though these are all the forms that occur within our limits, it may not be amiss to mention two forms that occur in Northern Europe and Greenland, and that may be expected to be found on the coast of Maine. *D. foeniculaceus* var. *flaccidus* Kjellm. has stem and main branches tubular, larger than in the type, but soft and easily torn. *D. corymbosus* Kjellm. has a short axis and long, subequal, nearly simple branches, not constricted at the base.

The following summary will give the more important references for the species named, and some synonymy:—

D. FOENICULACEUS (Huds.) Grev.

Greville, *Algae Britannicae*, p. 56, Pl. VIII.

Farlow, N. E. *Marine Algae*, p. 66.

*Phycotheca Boreali-Americana*, No. 673.

*Conferva foeniculacea* Hudson, *Flora Anglica*, p. 594.

var. FLACCIDUS (Aresch.) Kjellm.

Kjellman, *Algae of the Arctic Sea*, p. 268.

*D. flaccidus* Areschoug, *Observationes Phycologicae*, Part 3, p. 31.

var. AMERICANUS Collins.

*Phycotheca Boreali-Americana*, No. 674.

D. HISPIDUS Kjellm.

Kjellman, *Algae of the Arctic Sea*, page 270.

*Phycotheca Boreali-Americana*, No. 677.

*D. foeniculaceus* subspecies *hispidus* Kjellman, *Spetsbergens*

*Thallophyter*, Part 2, p. 39, Pl. II, fig. 1.

D. HIPPUROIDES (Lyng.) Kuetz.

Kuetzing, *Tabulae Phycologicae*, Vol. VI., p. 19, Pl. LII, fig. 2.

Farlow, N. E. Marine Algae, p. 66.

Farlow, Anderson & Eaton, Alg. Am.-Bor. Exsicc., No. 95.

Phycotheca Boreali-Americana, No. 675.

Scytosiphon hippuroides Lyngbye, Hydrophytologia Danica, p. 63,  
Pl. XIV, B.

var. FRAGILIS (Harv.) Kjellm.

Kjellman, Algae of the Arctic Sea, p. 268.

Phycotheca Boreali-Americana, No. 676.

D. fragilis Harvey in Kuetzing, Species Algarum, p. 485; Tabulae  
Phycologicae, Vol. VI., p. 19, Pl. LII, fig. 1.

D. MACOUNII Farlow.

Farlow, Bulletin Torrey Bot. Club, Vol. XVI., p. 11, Pl.  
LXXXVII, fig. 1.

D. EKMANI Aresch.

Areschoug, Observationes Phycologicae, Part 3, p. 52.

Phycotheca Boreali-Americana, No. 533.

D. CORYMBOSUS Kjellm.

Kjellman, Algae of the Arctic Sea, p. 267, Pl. XXVI.

The writer is indebted to Dr. L. Kolderup-Rosenvinge, of Copenhagen, for specimens of Dictyosiphon from Europe and Greenland, and for notes as to the differences between the American and the European forms.

## ASTER CONCINNUS IN NEW ENGLAND.

L. ANDREWS.

EARLY in September, 1898, while botanizing with Mr. C. H. Bissell along the foot of the precipitous cliffs of Meriden Mountain in Connecticut, we found, growing with the little fern, *Asplenium Trichomanes*, in the crevices of the rocks, a peculiar form of Aster. As these rock-crevices are usually very dry and devoid of soil, rarely supporting more than a small amount of vegetation, the occurrence of these Asters was very noticeable. A few specimens were collected, and, after drying, were examined, but with very unsatisfactory results.

Later, in making up a package for the New England Botanical Club, one of these strange Asters was included. The following portion of a letter, dated June 9, 1900, from Mr. M. L. Fernald, phanerogamic curator of the club herbarium, gives the result of his investigation.

"Your No. 674, *Aster* from 1,000 feet on Meriden Mountain, proves to be the extremely rare and little known *A. concinnus*, Willd. I have compared it with authentic specimens, which have themselves been verified by comparison in the Willdenow herbarium, and feel no hesitation in so placing it. The plant is one of the rarest and least known of American species and, though Dr. Gray doubtfully referred a few more southern specimens to it, your plant much better matches the authentic specimens which we have than does anything else I have seen. Other New England collectors have sent me plants under the name *A. concinnus*, but theirs have thus far proved to be forms of *A. laevis*. Your plant, as you will see, has thinner, greener leaves than that species, and the bracts are thin and linear-attenuate, not unlike those of *A. longifolius* or *A. paniculatus*. I hope you will watch the plant this year and secure us some good material. I am sorry that I did not detect the plant in time for your Flora of Meriden Mountain."

In the Synoptical Flora of North America, Dr. Gray says of *Aster concinnus*: "North America, received by Willdenow from Muhlenburg. An indigenous specimen from Pennsylvania, *Minn*, in herb. Cosson. This and perhaps that of North Carolina, *Schweinitz* in herb. Ell. (now lost), and Arkansas, *Harvey*, seem to be the only indigenous ones seen." We now have the pleasure of announcing in the pages of RHODORA an additional station for this extremely rare species.

SOUTHINGTON, CONN.

## A FEW ADDITIONS TO THE NEW HAMPSHIRE FLORA.

ALVAH A. EATON.

THE lists of New England plants which appear in RHODORA are very helpful to the general collector, showing him where knowledge is deficient and observation demanded. They should also help compilers of botanies so that no future work need leave a large percentage of a state's flora unrecorded.

"Massachusetts and South" is the limit of many plants found over the line in New Hampshire, and just about ten per cent of the plants found in this neighborhood are not accredited to the state in a recent pretentious work.

Under these circumstances it may not be amiss to amend the lists



as they appear, giving extension of range, and, in important cases, the localities.

*Gaylussacia dumosa* T. & G., in a bog at Nottingham.

*Gaylussacia resinosa glaucocarpa* Robinson, is more abundant in the coast towns of Rockingham county than the type; the fruit is larger, juicier, and more generally esteemed.

*Crantzia lineata* Nutt. Abundant about the Great Bay in the Squamscot River, Exeter, and at New Market.

*Sanicula canadensis* L. Seabrook and Kensington, among deciduous trees.

*Rhus venenata* D.C., is too common in many swamps.

*Polygala cruciata* L. Quite common on moist brackish grasslands, near the marsh. Seabrook, Hampton Falls and Hampton.

*Baptisia tinctoria* R. Br. Common in sandy woods near the coast.

*Genista tinctoria* L. This beautiful pest has been met with only at North Hampton, where it covers a space of about a square rod by the roadside. It is rapidly spreading.

*Lespedeza procumbens* Michx. Nottingham, N. H., a few plants only.

*Lespedeza reticulata* Pers. Kensington and Nottingham; sandy hills under deciduous forest.

*Lespedeza polystachya* Michx. Nottingham and Kensington, with the last.

*Medicago Lupulina* L. Not uncommon.

*Medicago arabica* All. Quite plentiful in a cultivated field at South Hampton. Not elsewhere observed.

*Cassia nictitans* and *Strophostyles* approach the line at Amesbury and may be expected in the state.

Two trees of *Acer platanoides* in a cemetery at Seabrook have started a numerous colony, but the saplings are not allowed to thrive. The seeds are spread broadcast by high northwest winds, and often travel one eighth of a mile, but as the soil is all cultivated none survive save in fence rows. Doubtless these will persist.

SEABROOK, N. H.

## CLEISTOGAMY IN LINARIA CANADENSIS.

J. R. WEBSTER.

IN August, 1898, I noticed at Milton, Mass., a plant of *Linaria Canadensis* that produced cleistogamous flowers only. In 1899, three

plants appeared within five or six feet of the spot where the first was seen. These were examined almost daily from April to October, and were seen to produce flowers abundantly, which were all cleistogamous. No other plants of this species were noticed in the neighborhood of these in either year. They grew in soil that was not very rich, and was composed of gravelly loam with a small addition of material from a peat meadow. They attained a height of twenty to twenty-four inches, developing branched racemes, some of which were a foot or more in length. Two of the plants branched from the bottom. They were exposed to the sun in the morning, but were shaded in the latter part of the day.

The closed corollas averaged about one-sixteenth of an inch in height and about one-twentieth of an inch in diameter at the base. They were closely contracted around the four anthers, and were compressed into a little knot at the top. The expanded bases of the filaments were confined within so small a circle that they coalesced, forming a small corona within the corolla. The corollas were white, with a faint blue tinge, slightly inclined to pink in the two or three cases in which a short spur was produced. Almost all the flowers were spurless. As soon as a corolla was pushed above its calyx by the growth of the ovary, it was separated from the latter and dropped. The flowers produced seeds.

Since my attention was first drawn to the occurrence of cleistogamous flowers in *Linaria Canadensis*, I have noticed them in racemes which bore also fully developed flowers on plants of this species growing in other localities. Mr. E. L. Rand, Mr. Walter Deane, and others have also noticed them. Several authors describe the plant as frequently having flowers with no corolla, or with a spurless corolla.

In Contributions from the U. S. Herbarium, Vol. III., No. 8, p. 517, Rydberg records from the Black Hills of South Dakota a form of this species: "Very slender and depauperate, apparently with cleistogamous flowers. The same form has also been collected in Nebraska by Rev. J. M. Bates, of Valentine."

Mr. T. S. Brandegee states in Zoe for June, 1900, p. 13, that he has noticed "a multitude of cleistogamous flowers on the lower part of the main and the whole length of the many side branches" of *L. Canadensis*, Dum., as it grows about San Diego.

SOME UNDESCRIBED VARIETIES AND HYBRIDS OF  
CAREX.

M. L. FERNALD.

IN the course of recent studies of New England Carices five forms have been examined which differ so markedly from the described species as to merit special recognition.

*CAREX VESTITA*, Willd., var. **Kennedyi**. Pistillate spikes solitary or, if 2, closely approximate, the upper sometimes androgynous; staminate spike very short, overtopped by the pistillate. Near Silver Lake, Wilmington, Massachusetts, June 11, 1899 (*G. G. Kennedy*). A remarkable plant, on a casual examination seeming to have only pistillate spikes, and thus appearing very unlike typical *C. vestita* with its long, clavate, staminate spike.

*C. MARITIMA*, Müll., var. **erectiuscula**. Spikes short, 1.25 to 1.75 cm. long, short-peduncled or subsessile, erect, not drooping, scattered or approximate: scales with shorter less conspicuous tips than in the species: perigynia smaller than in the ordinary American form, barely 3 mm. long. Cushing, Maine, July 10, 1888 (*F. S. Collins* in herb. C. W. Swan). An extreme form of the species parallel with *C. crinita*, vars. *minor* and *simulans*.

*C. lupulina* × **bullata**. Coarse as *C. lupulina*: pistillate spikes subtended by broad elongated bracts, solitary or 2, remote, sessile or short-peduncled, 3 to 5 cm. long, 3 cm. broad, mostly staminate at tip: perigynia firm as in *C. bullata*, but large and dull as in *C. lupulina*: principal staminate inflorescence peduncled; the peduncle about half as long as in *C. bullata*; the spikes numerous, as large as in *C. lupulina*. About small ponds in woods, Medford, Massachusetts, July 31, 1870 (*Wm. Boott*).

*C. retrorsa* × **utriculata**. Spikes and perigynia as in *C. utriculata*, but the perigynia mostly retrorse as in *C. retrorsa*. Connecticut, probably near Hartford (*C. Wright* in herb. C. W. Swan).

*C. virescens* × **arctata**. Slender and tall, 6 to 8 dm. high: leaves long and comparatively narrow (broadest 3 or 4 mm. wide), pubescent, especially on the sheaths: spikes slender, 2.5 to 5 cm. long, 2 to 2.5 mm. thick, mostly peduncled, ascending or spreading: perigynia as in *C. arctata*, minutely puberulent or glabrous. Wooded banks with both parents, Surry, New Hampshire, July 23, 1899 (*M. L. Fernald* in herb. Alstead School Nat. Hist. No. 242). Beautifully combin-



ing the characters of *C. virescens* and *C. arctata*. In foliage and pubescence like the former, but in inflorescence much nearer the latter species.

NEW OR RARE PLANTS FROM POWNAL, VERMONT. — Pownal, which has furnished so many records of southern and western plants in Vermont, was visited the last of May, and a number of species new to the state were found.

*Cornus florida*, L., reported by Dr. J. W. Robbins in 1829, from Castleton, and since reported in other parts of southern Vermont, but unrepresented by herbarium specimens, was there collected.

*Anemonella thalictroides*, Spach, reported from "southern Vermont" in Perkins's Flora, was found growing abundantly with *Ranunculus hispidus*, Michx., about the hills of North Pownal. The latter species has undoubtedly been mistaken many times for *R. fascicularis*, Muhl.

Other noteworthy plants found at the same time were *Ranunculus bulbosus*, L., *R. abortivus eucyclus*, Fernald, *Antennaria petaloidea*, Fernald, *Taraxacum erythrospermum*, Andrz., *Anemone riparia*, Fernald, and *Polygonatum giganteum*, Dietrich. — W. W. Eggleston, Rutland, Vt.

[Prof. S. F. Clarke, of Williams College, writes that *Anemonella* has been known for some years at "Weeping Rocks" in Pownal. *Ranunculus hispidus* was recently found by Mr. Ralph Hoffmann at Stockbridge, Mass., its first station in the state. — ED.]

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## SOME ORCHIDS OF EASTERN VERMONT.

ALICE E. BACON.

A SECTION of the Connecticut valley, within a radius of four miles from Bradford, furnishes some fine specimens of Orchidaceæ, as well as other plants of great interest to the botanist. Less than a mile from the village is a swamp entirely covered at this season (June 25) with *Cypripedium spectabile*, and a little earlier fine specimens of *C. pubescens* and *C. parviflorum* were gathered there. This particular swamp is also a favorite visiting place for many kinds of birds. In the heart of the village, on a hill forming one of the banks of Wait's River, a small tributary to the Connecticut, is found an abundance of *C. acaule*, during the last of May.

About two miles south is a high cool peat bog, from which I have herbarium specimens of the following: *Microstylis monophyllos*, June 24; *Calopogon pulchellus*, July 8; *Pogonia ophioglossoides*, July 16; *Habenaria hyperborea*, July 8; *H. Hookeri*, June 26; *H. blephariglottis*, July 24. I have also had *Tipularia discolor*, but possess no herbarium specimen, nor do I of *Spiranthes Romanzoffiana*, which is also found in this bog. Here is also found plenty of *Sarracenia purpurea*, just now in full flower. On the way to this peat bog we pass through pine woods, where we find *Goodyera repens*, var. *ophioides* and *G. pubescens*, and also *Habenaria orbiculata*.

Three miles west, in a wet meadow, are *Spiranthes cernua*, Aug. 31; *Habenaria virescens*, June 24; *H. psycodes*, July 29, and *H. fimbriata*, July 7. A close examination of the peat bog above mentioned should, I think, show us *Liparis*, and one or two more species of *Habenaria*.

About ten miles from here is a large swamp of several acres, which is literally crowded with gigantic specimens of *Cypripedium spectabile*; it has been practically undisturbed for generations, being far from tourist routes, and known only to the country people as a species of *Valerian*, and a specific for nervous troubles. Several hundred stems were gathered last year without any perceptible effect on the mass; many of the flowers were double—that is, with two inflated lips to one calyx, and the stems were from 2 feet to 3 feet high.

I hope to add to the number of orchids already found here, as others, I feel confident, should be in this section.

BRADFORD, VERMONT.

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BAPTISIA AUSTRALIS IN VERMONT.—For nearly ten years *Baptisia australis*, R. Br., has been known to me on islands and alluvial banks of White river in Royalton. The plant occurs in three places, all within a distance of forty or fifty rods, and within half a mile of Royalton Centre. The island, where the plant once grew, has never been grassed over, but is composed of alluvial sands supporting willows, bush clover, dogbane, etc. Recently, I think, this station has been destroyed by the washing away of a portion of the Island. In this locality I have not failed, when I have looked for it, to find the *Baptisia* in the past eight years. I have not taken the opportunity to look above and below on White river, but should expect to find it

below, and perhaps by the Connecticut. I have supposed the plant to be a relic of cultivation, as it has been cultivated in Royalton, and the colony may have started from a place two miles above the present station. A small brook passes through the place and seed may easily have been conveyed by the brook to the river.

In 1890 I saw the plant in a cemetery lot one mile up river from the established station, and not far from the bank. But it is hardly possible that seed could have been carried thence by water agency. So far as I know it is not conspicuously spreading.—LEVI WILD, Franklin, Vt.

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## BOLETI COLLECTED AT ALSTEAD, N. H.

H. WEBSTER.

A STAY of five weeks in the hill town of Alstead, N. H., in July and August, 1899, repeated in 1900, has given opportunity for the collection of many fleshy fungi. Among them, and peculiar to the season, are numerous species of Boleti, on which, in view of the increasing attention given to these plants, a few notes may not be out of place. The collections were made by roadsides, on open and wooded hillsides, and in the hollows between the hills, usually in woods. Alstead Centre is in the northern part of Cheshire County six miles east from the Connecticut River, at an altitude of 1120 feet.

Since the seasons, both in 1899 and 1900, were unusually dry in the region, a large and continuous crop of fleshy fungi was not to be expected, and collections on the whole were rather meagre. Nevertheless, here and there a mossy slope, or a springy bank, or a mass of water-soaked decaying wood, held moisture enough to prevent the total non-appearance of the fungi naturally sought in such places; and well-shaded brooksides, swamps, and bogs were explored, not without success. Indeed the variety, if not the abundance of fleshy fungi was sufficient to keep interest unflaggingly alive, and to furnish material for constant study.

A word as to the treatment of the material collected may be suggestive to others similarly situated, especially if they would preserve Boleti. The process of drying, usually the stumbling block in the field, was as follows. In the first place a visit was made to the tinsmith, who



for a few dollars constructed a sheet iron box with shelves of wire netting. The dimensions of such a box may be adjusted to suit individual needs. A convenient size is four feet high by two feet square or less, with sliding shelves three inches apart. These should be of strong coarse wire netting, bound at the edges. Small squares of fine wire netting are convenient, also, for the reception of collections of small species. These can be laid on the shelves. The box is without a top and without a bottom, with a door in front, where it is held from collapsing by bands of sheet iron above and below the door. At the very bottom holes around the sides admit air. A kerosene stove completes the equipment. The height of this determines the position of the lowest shelf, on which it is well to lay a small plate of tin or glass, directly above the lamp, to distribute the heat. With this apparatus, the lamp with a low flame, relays of fungi may be conveniently dried; a lot put in in the evening will dry in the course of the night. When dry they may be allowed to accumulate on driers heaped on floor or table until a misty or rainy atmosphere renders them flexible enough to be put to press. Some five hundred collections were treated successfully in this way in five weeks in 1900. It seems probable that a portable drying box of the kind described, that could be arranged to fold or clamp at the corners, might easily be made.

Among the fleshy fungi, properly so called, collected at Alstead, the Boleti are prominent, as was to be expected, in a number of species. The following list, with notes, will show what it was possible to find among the hills of New Hampshire in a dry season.

It is natural, of course, to find *Boletinus pictus* Peck in every sphagnum bog, and on the mossy hummocks in wet woods, especially where there is abundance of decayed wood. It appears in Alstead at least as early as July 4, and probably earlier. Occasionally a rotten log may be found bearing a half dozen fruits in various stages, when the mycelial strands may be disclosed by tearing the log to pieces. All specimens examined had the solid stem and the dark red color required by the author's description, but were slightly umbonate. As found about Boston the species appears closer to *B. cavipes* Kalch., for the stem is usually hollow at the base, although the color is not that ascribed to the latter species.

*Boletinus porosus* (Berk.) Peck is occasional, but *B. paluster* Peck has not yet been found. It has been collected at Centre Harbor by Mr. C. F. Grover.

*Oseripee*

F. O.

Of the viscid Boleti only a few species occur so early in the season. *Boletus Americanus* Peck has been repeatedly collected. Reports of it are not infrequently to be referred to *Boletinus pictus*, which in its late stages loses most of its tomentum and appears very yellow. *B. albus* Peck has occurred several times in open woods, and *B. granulatus* L. more often, though not in its autumnal abundance. One or two specimens intermediate between the two, but inclining towards *B. albus* suggest the close affinity of the two species. I have generally found, however, that in *B. albus* the pileus is small in comparison with the length of the stem.

The only other members of the section Viscipelles so far found about Alstead are *B. rubinellus* Peck, and *B. piperatus* Bull, two species which hardly show any viscosity, except in wet weather. The former grows in small quantity in two or three localities, one of which is in mixed woods; and another on an open hillside in moss just at the edge of a hemlock grove; one or two plants grew on decayed wood. Although at first glance much like *B. piperatus*, especially when the pores have become brown, the red and yellow tints of pileus and stem easily distinguish *B. rubinellus*. In its young state its coloring is most attractive, the comparatively large pores and often the upper part of the stem being of a peculiar red — almost Indian red in one instance. With the ripening of the spores this striking tint disappears from the tubes. Some dried specimens still retain a trace of it, and preserve the red and the marginal yellow of the pileus remarkably well. In the dozen or more specimens found, the stem was yellow at the base as in *B. piperatus*, and with yellow flesh; it was minutely flocculose above, and fibrous striate below. The yellowish white flesh of the pileus generally showed a faint band of pink near the pores. The dimensions of the spores were  $13\frac{1}{2}$  by  $3\frac{1}{2}$   $\mu$ , or a little more [ $12\frac{1}{2}$  to 15 by 4, Peck]. Mature plants were found on July 21, 1899, and somewhat younger ones on July 18, 1900. Whether it will continue to appear at about that date remains to be seen, but it is not improbable that it may always be fairly prompt to date, like some other species, whose limited occurrence both in place and time is in such strong contrast with such plants as *B. scaber*, *B. subtomentosus*, and even *B. piperatus*. The last species is fairly abundant along roadsides and in woods, from the middle of July, or earlier, well into August, and probably later. In dried condition its resemblance to the browner forms of *B. rubinellus* is close. The determination of *B. rubinellus* was kindly confirmed by Mr. Peck.

Of the pruinose and subtomentose boleti, five species out of six or eight found, are easily recognizable. *B. miniato-olivaceus* Frost var. *sensibilis* Peck seems less common than about Boston, certainly not common enough to suggest the dangerous experiment of eating it.<sup>1</sup> It may be remarked, however, that the writer has eaten fresh young specimens of this *Boletus* (the pores removed) without any other than pleasurable results. Boleti even more than other fungi demand to be eaten as soon as gathered.

*B. bicolor* Peck, in exact agreement with the author's description, was found under a hemlock on a hillside on July 21, 1899. Its small pores and red stem are conspicuous even in the dried state.

The *Boletus* that has been found in greatest quantity about Alstead is one that I have referred to *B. subglabripes* Peck. It agrees well with the author's figure in Report 51 of the New York State Museum, and with the description, except that the flesh is usually pale-yellowish or yellowish-white, and the branny particles on the stem, in carefully handled specimens, can hardly be overlooked. Sometimes, a reddish tint appears on the lower part of stem at maturity. The color of the pileus is, in general, dead-leaf brown, with occasional chestnut tints in the pale-yellow color of pores and stem; and in other points, including the dimensions of the olivaceous spores ( $12\frac{1}{2}$  to 15 by 4 to  $5\mu$ , Peck), it agrees well with the description, although the average size of the spores appears to be about 13 by  $3\frac{1}{2}\mu$ . This *Boletus* is conspicuous about Alstead by reason of its abundance, and its repeated appearance in woods and along wooded roadsides in July and early August. It has several times been gathered in sufficient quantity to furnish a dish at table, and can be recommended to those who like Boleti. Certain specimens are somewhat pitted or corrugated (var. *corrugis* Peck). This determination has been approved by Mr. Peck.

Of *B. chrysenteron* Fr. a few doubtful specimens have been collected, referred here because of their yellow flesh.

*B. subtomentosus* L., is common and extremely variable. The points relied on for recognition have been the soft, strongly tomentose pileus, the long, large, depressed, but often decurrent pores, the ribs on the upper part of the stem, the unchanging pale flesh, and the yellow mycelial strands at the base of the stem, which is sometimes reddish within.

The Calopodes are so far represented at Alstead by *B. ornatipes*

<sup>1</sup> See RHODORA, 1: 2, pp. 21—23, Feb. 1899.



Peck, which is rather frequent towards the end of July, and by *B. pachypus*, Fr. which has been found twice. The former species, with its prevailing yellow color under a brownish pileus, and strongly reticulate stem, is familiar. The specimens referred to *B. pachypus* are few and somewhat doubtful, still they will go nowhere else. In general they agree well with the description; but the stem is not particularly thick, and the spores are of the usual *Boletus* type, and not ovate. Their dimensions are 14 by 4  $\mu$  (14 by 6 Masee, 12½ to 13¼ by 5 to 6 Peck). More material is needed to confirm this record.

Three species on the list are referable to the *Edules*. The first of these, *B. separans* Peck, occurs here and there, one or two plants at a time, in July and later, and is generally thick-stemmed and much injured by insects. The brownish-red of the pileus, with often a yellow margin, the lilac tints of the young buttons, and the tendency of the pores to separate from the stem, are fairly constant characters.

Most worthy of note is *B. eximius* Peck. No firmer, heavier *Boletus* can be found, nor any more instantly recognizable. Its purplish-brown pileus, dark pores, and dark, hard, furfuraceous stem, distinguish it at once. The tubes, it may be noted, are dull ochraceous or pale dead-leaf color, and in a vertical section contrast with the grayish or grayish-purple flesh. This *Boletus*, which seems not to be frequently collected, occurs sparingly at Alstead in July and August. A fine group of them was found on July 22, 1900, and being unusually free from insects, was welcome as herbarium material.

*Boletus affinis* Peck, has been collected several times, but rarely in condition for preservation. It is usually very soft, and succumbs quickly to moisture, heat, and insects.

With the exception of one imperfect specimen, very doubtfully referred to *B. Satanas* Lenz, and one specimen which is either *B. alveolatus* B. & C., as described by Frost, or more probably *B. Frostii* Russell, the *Luridi* are represented only by *B. luridus* Schaeff, in various pale forms. Typical *B. luridus* has been found once. In the specimens met with orange generally took the place of red, and the pores were hardly vermillion. Other characters were good.

The single specimen referred to *B. Frostii* is shining blood-red, with a somewhat uneven pore surface, and flesh which changed to blue. The reticulations of the stem are distinct, and the color strong, but there is no great roughness or raggedness of surface, as in specimens frequently collected in eastern Massachusetts.

The three common species of the section *Versipelles* are common also at Alstead, the most frequent being, of course, *B. scaber* Fr., which, much to the annoyance of driving parties, has always to be investigated along roadsides, lest something more interesting may be overlooked. There are always exciting possibilities about a glimpsed *Boletus*. *B. versipellis* Fr. is less frequent, but common enough to earn the neglect of collectors. *B. chromapes* Frost, on the other hand, partly from the attractive contrast of the pink of the pileus and the yellow of the stem, and partly because it occurs less frequently than expected, has usually been brought in when found. It begins to appear late in July.

Two species of *Hyporhodii* have been collected, *B. gracilis* Peck, which is not common, and *B. felleus* Bull. which is. There is little to be said of either. *B. felleus*, however, is not so large as I am accustomed to see it. A small form of it is not infrequent on stumps, presumably of hemlock, as noted by Peck.

*B. cyanescens* Bull. and *B. castaneus* Bull. represent the *Cariosi*, neither of them frequent so far as seen.

Since the preceding account was in type, a few more forms deserving notice have been collected. One of these is plainly referable to *B. badius* Fr., although the viscid cap is hardly shining when dry, and the flesh shows no blue, but after a time a pinkish tint. The stem is somewhat lined and finely brown-punctate. It agrees almost exactly with the figure in Michael's *Führer für Pilzfreunde*, a little book whose excellent colored plates ought to be better known. *B. affinis* Peck is sometimes confounded with *B. badius*, but is a much softer species, with flesh that usually turns yellowish, and pores that show bright ochraceous tints, whereas those of *B. badius* turn promptly to green when wounded.

A single specimen, which can be only *B. griseus* Frost, was found July 28, 1900, on a drive to Keene. The grayish cap, small white tubes, and beautifully reticulated whitish stem identify it, in spite of some discrepancy in its proportions.

Another single specimen, obtained on the same drive, is a form, akin to *B. luridus* which shows distinctly the characters ascribed to *B. erythropus* Pers. It has a long slender cylindrical stem, the flesh of which is red all through within. Its spores are large, 17 by 6½ µ.

Among many forms, which were at first placed with *B. luridus* one, which was sent to Mr. Peck, has been referred by him to *B. vermiculosus* Peck. The velvety pileus is brown, or yellowish brown; paler

towards the margin; the stem is similar in color, with a close scurfy covering, glabrous and somewhat yellow above, marked with raised lines as in *B. luridus*; the tubes are yellow with brown mouths; the yellow flesh and the tubes change almost instantly to blue. Its spores are "too small for *B. luridus*," being 10 to 11½ by 5 to 5½  $\mu$ .

In addition there is the usual remnant of isolated collections awaiting determination, the final disposal of which may increase the list. Specimens of all the species here mentioned are preserved in the herbarium of the Alstead School of Natural History, and many of them also in that of the Boston Mycological Club.

## ORCHIDS OF MT. GREYLOCK, MASSACHUSETTS.

A. LEROY ANDREWS.

MT. GREYLOCK, from its foremost position among the mountains of Massachusetts, and its recent promotion to the dignity of a State Reservation, assumes such an importance that a brief consideration of a few of its floral features may not be out of place. The mountain, situated in western Massachusetts, represents a detached spur of the Taconic system and forms an irregular mass several miles in length and breadth, with several peaks and various depressions and eroded valleys. On account of its great extent and its varied conditions of altitude, soil, drainage, and exposure it presents a flora of great interest and variety.

In point of distribution its Orchids especially furnish a study which well rewards investigation. We may conveniently divide the mountain surface into four sets of conditions, marked generally by pronounced floral distinctions, as follows: 1. Unwooded lower slopes including grassy pastures, springy meadows, narrow drainage valleys, etc. 2. Lower wooded slopes. 3. Upper wooded slopes. 4. Clearings, at various elevations, generally thickly overgrown with June grass, sometimes with blueberry bushes, ferns, etc.

In the first-mentioned localities, comparatively dry, steep, hillside pastures yield *Habenaria lacera* and *Spiranthes gracilis*, both very common species of this portion of Massachusetts. The more moist, level places furnish *S. latifolia* and *S. cernua*. Upon a steep bank with a colony of sundew grows *Habenaria tridentata*.



The areas referred to as the lower wooded slopes are possibly the richest in species and afford approximately in the order of ascent, *Orchis spectabilis*, *Cypripedium acaule*, *Habenaria Hookeri*, *Liparis liliifolia*, *Habenaria bracteata*, *H. hyperborea*, *Corallorhiza multiflora*, *Habenaria orbiculata*, and *Goodyera tessellata*.

While it is hard to draw a definite line between the lower and upper slopes the following distinction may generally be made, the lower are usually well drained by numerous brooks giving firmer and drier soil, while the forest growth is largely of deciduous species; the upper, on the other hand, are extremely wet and cold, and evergreen trees preponderate, particularly spruces and balsams. To the upper slopes belong *Microstylis monophyllos* with occasional specimens of *Corallorhiza innata*, the drier soil under spruce groves being carpeted with beautifully reticulated leaves of *Goodyera repens* var. *ophioides*. *Habenaria dilatata* is also reported here, probably correctly, though I have not yet seen it.

The clearings are characteristic, generally natural, and frequently of considerable extent. *Habenaria lacera* is unfailingly present, and, no matter how dry the soil or the summer, always makes an effort to unfold its flowers and develop its seed. As a good example of the pertinacity of this species, I found on a very small grass plot not far below the summit, at an elevation of something over three thousand feet, two specimens just coming into bloom, the date being the seventh of August, a month later than its date of flowering in the valleys below. The occurrence of *Microstylis ophioglossoides* in one of these dry, grass-covered meadows is noteworthy as so inconsistent with its usual habitat. It occurs, so far as I know, only in one place, but is there rather abundant and seems to thrive and bloom as well as in more congenial swampy localities, though it very seldom develops a seed-pod.

The above observations are based upon personal exploration of a portion of the mountain surface, and while not necessarily exhaustive, and probably admitting of exceptions and additions for other portions, may be taken as a fair statement of the general conditions of growth and distribution of Orchidaceae of Greylock Mountain.

THETFORD ACADEMY, Thetford, Vermont.

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